

Cooler bedroom temperatures may boost metabolic activity

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A new study has found that turning the thermostat down a few notches at night may expand brown fat tissue mass and activity, which could lead to metabolic benefits such as more effective disposal of glucose.

Researchers found that mild, prolonged [cold exposure](#) – in the range commonly achieved in climate-controlled buildings – is sufficient to expand brown adipose tissue mass and activity, while exposure to warm temperatures result in suppression of this tissue.

Brown adipose tissue is a specialized form of [fat tissue](#) that produces heat by burning energy to maintain an organism's core temperature.

In the study, published last month in the journal *Diabetes*, researchers studied the effects of long-term exposure to mild cold on fat cells in five healthy, lean male volunteers. They spent a total of four consecutive months sleeping in the temperature-controlled rooms at the National Institutes of Health Clinical Research Center. They were able to perform normal activities during the day.

During the first month, the overnight temperature was "neutral" at roughly 75 degrees. The next month it was cooled to 66 degrees; for the third, it went back to 75 degrees; and finally, for the fourth, it was 81 degrees.

At the end of each month the volunteers underwent metabolic testing in the metabolic chambers at 75 degrees and 66 degrees. After four weeks

of sleeping at 66 degrees, the team noted double the volume of [brown fat](#), and insulin sensitivity improved.

"Our study was performed in lean healthy volunteers, but this is an important proof of concept that brown adipose tissue activation can provide metabolic benefits, such as a reduced risk for diabetes," said lead author Francesco S. Celi, M.D., chair and professor in the Division of Endocrinology and Metabolism at the Virginia Commonwealth University School of Medicine.

According to Celi, who conducted the research at the National Institutes of Health (NIH) while he was staff clinician at the National Institute of Diabetes and Digestive and Kidney Diseases, the team will expand their research to examine these effects in individuals who are overweight or insulin-resistant who may benefit from these results.

In previous work, the team analyzed the effects of acute cold exposure and identified crosstalk between skeletal muscle and brown fat tissue that is mediated by an exercise-induced hormone. This metabolic signaling may help the body more efficiently maintain its core temperature.

Provided by Virginia Commonwealth University

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